

# Karthik Pullalarevu

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## EDUCATION

### Carnegie Mellon University

Master of Science in Computer Vision, Robotics Institute.

**Courses:** Advanced Computer Vision, 3D Vision, Reinforcement Learning

Pittsburgh, PA

August 2025 – December 2026

### Vellore Institute of Technology

Bachelor in Computer Science & Electronics – CGPA 9.17/10

**Courses:** Machine Learning, Data Structures and Algorithms, Micro-controllers

Chennai, India

July 2018 – May 2022

## EXPERIENCE

### HyperVerge [200-member, bootstrapped and profitable AI startup]

Lead Machine Learning Engineer (MLE 3)

Bangalore, India

January 2022 – July 2025

- Led R&D for the Face Fraud Detection team, a core product **generating 30% of company revenue** across India, APAC, and Africa; built and optimized **10+ vision models** for face quality assessment and spoof detection.
- Developed and released custom ViT-based models for face spoof and deepfake detection, achieving **0.15% FAR & 0.06% FRR**, serving **20 million verifications monthly** in production.
- Built efficient multi-modal transformer models using language, depth, and video modalities; experimented with distance metrics to **improve generalizability against unseen attacks**.
- Reduced model size from **335MB to 28MB** and cut CPU **inference latency by 60%** through tailored quantization techniques (distillation + pruning), enabling real-time on-device deployment.
- Created an ANN-based anomaly detection model using mobile sensor data, **eliminating image injection attacks from 200/week to 0** within a month.
- Built an **LLM powered hiring agent** that parsed resumes, scored candidates, and conducted automated interviews to assess AI fundamentals, **cutting hiring time by 96%** and **cost by 65%**.
- Tech Stack:** Generative AI, Vision Transformers, GANs, LLMs, AWS, Docker, ONNX, Multimodal data, PyTorch

### ÉTS Montreal

Research Intern [Guide - Dr. Hervé Lombaert]

Montreal, Canada

August 2021 – December 2021

- Key Contributions to research on Graph CNNs for cortical shape analysis, increasing brain parcellation accuracy by 3%.
- Developed an efficient Python pipeline for spectral alignment of brain mesh surfaces. [\[code\]](#) [\[certificate\]](#) [\[presentation\]](#)

### Agency for Science, Technology and Research

Research Intern [Guide - Dr. Renuga Kanagavelu]

Remote, Singapore

June 2021 – November 2021

- Developed federated learning simulation with two clients for semantic segmentation of live tumor using Flower platform.
- Led end-to-end solution, drove experiment design, metric definition and visual analysis resulting in a Dice score of 0.793.

### Tata Consultancy Services - Research Labs

Machine Learning Intern

Noida, India

May 2021 – August 2021

- Built 2D/3D U-Nets to segment hepatic vessels from CT scans for non-invasive diagnosis of portal hypertension.
- Applied preprocessing techniques like contrast enhancement, windowing, and domain adaptation from veins to vessels, achieving a Dice score of 0.53. **Tech stack : Convolution Neural Networks, Image Processing, Computer Vision**

## TECHNICAL SKILLS

**Programming Languages:** Python (Advanced); C++, R, Java, MySQL (Intermediate)

**Frameworks and Tools:** PyTorch, Docker, Git, Timm (Advanced); TensorFlow, OpenCV, AWS (Intermediate)

## PUBLICATIONS & PATENTS

- Method And System For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Method And System of Video Processing For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Method And System of Image Processing For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Karthik, P.**, Parashar, M., Reka, S.S. et al. Semantic segmentation for plant phenotyping using advanced deep learning pipelines. *Multimedia Tools & Appl* [[10.1007/s11042-021-11770-7](https://doi.org/10.1007/s11042-021-11770-7)]
- Karthik, P.**, Parashar, M., Reka, S.S. Robust Deep learning Model for Detection of Tomato Bacterial Spot on Novel Dataset. *Scientific Reports* [Under Review]

## RESEARCH PROJECTS

### Multiview pose synthesis from 2D objects | *Diffusion models, Novel View Synthesis, Neural Radiance Fields*

- Developed an end-end approach to edit pose of an object in a 2D image given the azimuth and polar values.
- The pipeline includes text-guided segmentation, image to 3D view generation followed by Stable Diffusion Inpainting and replacing the generated object in the masked image. [\[code\]](#)

### Quantification of COVID-19 chest CT scans - Mayo Clinic | *Machine Learning, Optimisation*

- Extracted tracheal regions from 600+ COVID-19 patient CT volumes using the airway extractor module in Slicer 3D software. Applied feature engineering techniques (Lasso, Boruta) and trained models (logistic regression, SVM, decision trees) to quantify tracheal infection. (Guide: [Dr. Rajagopalan Srinivasan](#))